
Public Health Measures for Prevention and Control of AIDS

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Synopsis.....

The grave challenge posed by the recent pandemic of acquired immunodeficiency syndrome is not the first time mankind has faced such a threat. Useful lessons may be drawn from the successful global Smallpox Eradication Program and applied to the current campaign in the areas of surveillance, strategy, operations, and evaluation. The most important epidemiologic characteristic of this new infection is the unprecedented

observation that virtually all asymptomatic infected persons are infectious and will remain so indefinitely.

In combatting this infection we should concentrate our efforts in the United States on preventing transmission from the estimated 1.5 million persons who are already infected. We must make the best use we can of all the tools we already have: public information, health education, counseling and serologic testing of persons at high risk, treatment and prevention of intravenous drug abuse, and serologic screening of organ and tissue donors. Adequate confidentiality of test results needs to be secured in order to promote voluntary testing as an important means of achieving behavioral change among persons who are most likely to have been exposed to the infection. Persons whose sexual or drug abuse behavior puts them at higher risk of infection are the highest priority target group. They should be sought at every opportunity, whether seen in public clinics or private practice, and advised to be tested.

In order to focus on preventing sexual, parenteral, and perinatal transmission of the virus we must avoid numerous potential distractions and irrelevant issues: we don't have time for them.

... one learns at the cost of human life what happens when one receives from God the scourge of an epidemic without having any light or experience wherewith to guide one's conduct in so exacting a task (from a notebook written during an outbreak of plague in northern Italy in 1631) (1).

AS UNWELCOME AS IT IS, the fear, devastation, and consternation engendered by the AIDS epidemic is not unprecedented. On several previous occasions, mankind has had to rise to analogous challenges. A century before the outbreak of plague just referred to, for example, Europe faced the first widespread outbreak of syphilis it had ever seen. At the same time, American Indians were beginning to experience perhaps the worst such epidemiologic catastrophe ever, as a result of the introduction of smallpox.

It is thus a supreme historic irony that only 13 months after the world celebrated the eradication of smallpox, we first recognized the beginnings of another deadly viral affliction which rapidly became a new global problem. In considering public health measures for the prevention and control of acquired immunodeficiency syndrome (AIDS) and human immunodeficiency virus (HIV) infection, I believe it is worthwhile to try to exploit any appropriate lessons we can learn from relevant past experiences, especially the Smallpox Eradication Program. I am convinced that there are such lessons, pertaining to surveillance, strategy, operations, and evaluation.

Surveillance

Adequate surveillance is as critical to the prevention and control of HIV infection as it was key to

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eradication of smallpox. We should be grateful that we had a system of surveillance and epidemiologic analysis in place in the United States to permit detection of the outbreak, definition of the syndrome, characterization of the modes of transmission, and institution of some specific effective recommendations for preventing transmission before the cause of AIDS was ever known. (As late as the 1935 edition of Sir William Osler's "Principles and Practice of Medicine," smallpox was still listed among the diseases of uncertain etiology) (2). We should also be grateful that we now have an additional tool for epidemiologic surveillance and investigation of HIV infection, in the form of serologic tests, following the discovery of the virus and other advances by laboratory researchers.

In my opinion, the single worst characteristic of HIV infection, epidemiologically speaking, apart from its fatality, is the fact that virtually all asymptomatic infected persons are able to transmit the infection to others, and not only that, but they will probably remain infectious for as long as they live. That characteristic of lifelong infectiousness is unprecedented, and it should be a major concern in considering strategies for prevention and control, including of course, surveillance. Other important issues in this regard are the as yet unanswerable question of how extensive heterosexual transmission will prove to be in North America and Europe, and the possible role of HIV-2 and perhaps other strains of closely related viruses.

In the meantime, we must do all we can, using the few tools we have, to get the best possible measures of the true incidence and prevalence of infection. And we must do this as quickly as possible so as to better judge where we are and assess the efficacy of interventions. Recent efforts to make maximal use of anonymous blood samples from persons bled for other purposes in hospitals, as well as monitoring results of testing at blood banks, testing and counseling sites, on application to the U.S. Armed Forces, and via special surveys,

are other important steps in the right direction. Those of us in public health should use such opportunities that may come about, whenever appropriate, to help monitor changes in prevalence and incidence and to evaluate the efficacy of various interventions.

Available Interventions

Whereas in the case of smallpox, we had an excellent vaccine with which to prevent that disease, with AIDS, we must make do with other tools, at least for the foreseeable future. These include public information, health education, counseling and serologic testing of persons at high risk, treatment and prevention of IV drug abuse (especially the practice of sharing needles), and serologic screening of donors of blood, sperm, and other tissues or organs. It behooves us to exploit all of these approaches as intelligently as we can, sometimes even before we can be certain which ones are most effective. However much it may offend our twentieth century fascination with high technology and quick fixes, we dare not wait until a vaccine can be deployed against this new adversary, if ever. Even under the most optimistic projections, the scope of this pandemic will be decided before any hoped-for vaccine can come to our rescue. Availability of a preventive or curative treatment, however, would immediately add an incentive for persons who are at higher risk of infection to be personally counseled and tested as well as help those who are already ill. My own view, as a former pediatrician, is that existing knowledge about HIV infection and about the currently available antibody tests is already such that persons at higher risk would be well advised to consider being voluntarily tested as early as possible, for the sake of their own personal health (3).

The terrible stigma which has come to be associated with HIV infection, and the attendant risks of discrimination and worse, are among the most important constraints to optimal use of serologic testing. We therefore *must* address those constraints head-on by ensuring that such testing is always conducted with adequate assurances of confidentiality, with pre-and-post test counseling, and in most circumstances, with specific consent. Serologic testing that is offered routinely in appropriate settings, with consent, and that is voluntary, should be promoted.

The main public health objective in regard to AIDS is to *prevent infection*. Thus if the net effect

of widespread mandatory testing would be to reduce the number of persons at higher risk who are in fact counseled and tested, because many others are scared away, then mandatory testing would not serve that crucial public health objective. While each must be used appropriately, we cannot afford to discard any of the few tools we have: public information, health education, counseling and testing, treatment and prevention of IV drug abuse, and serologic screening of donors.

Strategy

In the area of strategy and tactics for preventing and containing HIV infection, the American public has had to listen and look for the informed recommendations of its public health and medical leadership amidst the clamor of advice from a variety of sometimes well-meaning, but ill-informed, persons. Here, it may be seen, a little ignorance goes a long way with modern communications in the service of essentially irrelevant personal, political, or professional agendas. Many of the remarks and proposals I am referring to ought to be preceded by a disclaimer on behalf of their proponents: "I'm not an epidemiologist, but I play one on TV."

The original mass vaccination strategy against smallpox was superseded by the more efficient so-called selective-containment strategy, which meant that attention, especially vaccination efforts, could be concentrated on the 2 or 3 percent of the population at highest risk, that is, on those families or villages where there was smallpox, rather than on 100 percent of the population. Similarly, the dispensing of information to the general public in North America, where overall infection rates with HIV are still low, is useful and necessary to help everyone understand what behaviors will put them at risk of acquiring or spreading the infection. But that will probably not be the most productive intervention in terms of numbers of cases prevented. It is still needed; this is not a case of either-or. Highest priority should go to providing information, health education, and voluntary testing and counseling activities where they are most needed: to persons who are most likely to have been exposed to the infection.

Apart from continuing to screen donors of blood and other tissues, in North America the largest numbers of infected persons will be found by counseling and testing sexual partners or needle-sharing partners of known infected persons, persons attending sexually transmitted disease

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(STD) clinics or treatment centers for drug abuse, and persons with any sexually transmitted disease, with historical or other evidence of IV drug abuse, or with newly diagnosed cases of active tuberculosis, *where ever they are seen*—whether in public clinics or private practice.

Among the steady heterosexual partners of seropositive persons in the United States, 9–58 percent were found to be serologically positive in various studies (4,5). At "alternate test sites" in calendar year 1985, of 79,083 persons tested, 17 percent were positive for HIV infection; in 1986, 15 percent of the 179,169 tested were positive. According to Dr. Martin Cader of the Virginia Department of Health, of 1,407 persons attending an STD clinic in Virginia who were tested, 7.6 percent were positive for HIV infection.

The important point is that persons whose sexual or drug abuse behavior puts them at higher than average risk of infection with HIV should be sought at every appropriate opportunity, counseled, and advised to be tested, in order to achieve the maximum yield from resources available for preventing further spread of the infection and for extending medical care to those who need it. Such persons are not randomly distributed through the entire population. Counseling and testing thus should be used as another means, in addition to information, health education, and drug treatment, of seeking to promote behavioral change in persons at risk of acquiring or spreading the infection.

Perinatal transmission of HIV infection is completely preventable. Recommendations to prevent such transmission were published over a year ago (6), and thus every such infant being born now and henceforth is an indication of someone's

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failure: be it the mother, father, physician, counselor, or whoever. Here again first, but not exclusive, priority should be given to testing and counseling women of childbearing age who are most likely to have been infected or who may be at high risk of infection. Most such women can be identified on the basis of a conscientious medical history and physical examination, or geographic location of their residence. At a hospital in Brooklyn, NY, for example, Dr. H. L. Minkoff has found that 2.4 percent of the women seen in prenatal clinics were serologically positive for HIV infection in 1986. Obviously, such women should be counseled and serologically tested before they become pregnant for their own sake, for the sake of their unborn child, and for the sake of their sex partner(s) or needle-sharing colleagues. As with smallpox, the appropriateness of various strategies and tactics will vary depending on the prevalence of infection and other factors in any given area.

Operations

In smallpox eradication, successful programs clearly recognized that reduction in smallpox incidence, not vaccination coverage itself, was the true objective. So we now also must keep our eye on the real ball; and our ball in the United States is the estimated 1.5 million persons infected, not just the 36,000 persons diagnosed with AIDS so far. The potential distractions from our goal of preventing further transmission from those already infected are numerous and seductive. For example, the smallpox virus, like the AIDS virus, could also be isolated from the tears of some of its victims, but that interesting laboratory observation was of no epidemiologic significance whatsoever, and epi-

demologists in the program knew that. We need to concentrate our energies on preventing sexual, perinatal, and parenteral transmission of HIV infection, not on putative mosquito-borne infection, or casual contact, or foodborne transmission, or on attempting to quarantine hundreds of thousands of people. According to a recent U.S.-News CNN poll conducted by the Roper Organization, two-thirds of those asked believed restaurant workers should be checked for infection. Where this virus is, and where it is going are questions of far higher priority than where it came from. The tiger is already in our house; whether it entered through a window or through the back door may be useful to prevent other carnivores from entering later, but immediate attention had better be directed to the problem at hand.

According to another recent poll by Media General-Associated Press, 48 percent of adult Americans said they feared AIDS more than any other disease, compared with 47 percent who feared cancer the most. Yet three-fourths of 800 adults surveyed in Illinois by the State Department of Public Health reported they were taking no precautions to avoid contracting AIDS. A young college student in Atlanta was quoted recently as saying she was afraid of catching herpes, not of getting AIDS. Part of our job should be to help such people understand that their actions, not their fears, are what matter. Just as hope is not an effective form of birth control, neither does it protect against HIV infection or herpes. But the basic message to prevent sexual transmission of herpes, AIDS, and other STDs is the same: it is abstinence, sexual monogomy with an uninfected person, or use of condoms.

Operationally the main task, simply stated, is to identify all infected persons as quickly as possible and persuade them to avoid transmitting the infection to others, while simultaneously seeking to convince everyone else to avoid putting themselves at risk of acquiring the infection. Leadership is important in order to help identify the most important objectives and direction, keep priorities straight, define the real issue clearly, avoid distracting sideshows, and emphasize the essentials.

Evaluation

In the latter stages of the Smallpox Eradication Program, a handful of measurable indices directly tied to operational objectives was sufficient to monitor the functioning of local or national operations. Under the surveillance-containment

strategy, such indicators as the average interval between the appearance of smallpox in a village and when it was reported, the time between the report and the beginning of control measures, and the time between the beginning of control measures and the onset of the last case in a village were easily determined, to the point, few in number, and extremely effective. "Process" indicators, such as take rates and assessment of vaccination coverage, were also important. But the most important indicator was incidence of smallpox.

For AIDS programs, somewhat comparable operational indices might include the proportion of STD, drug abuse, and family planning clinics in an area that routinely offer HIV testing and counseling; the proportion of estimated infected persons in an area who have been tested; the proportion of States offering voluntary referral of contacts of known infected persons (three States do so now); and the proportion of schools or school districts offering minimal classroom instruction about HIV transmission and AIDS, for example. Other measurable indicators, which have already been used in a few areas, include results of public opinion polls to help judge the effectiveness of health education messages on a few critical items, self-reported changes in sexual or intravenous drug abuse behavior, incidence of other STDs in target populations and, ultimately, incidence and prevalence of HIV infection itself. In a few areas, some of these measures have already been used as surrogates to document apparent progress against transmission of HIV infection.

Conclusion

Finally, this is a global fight we're in. It demands international cooperation. The Smallpox Eradication Program was characterized by its internationalism, which overcame national, racial, political, cultural, and ideological barriers. It is a measure of how far we've strayed from that ideal in this current struggle that we are faced with the sad spectacle of newspaper reports in many countries promoting the disinformation that scientists of another nation deliberately created and disseminated the HIV virus to start this epidemic. I understand that last month the World Health Assembly unanimously adopted a resolution calling on all countries to cooperate in combatting this disease and affirming the natural origins of the AIDS virus.

Meanwhile, the real enemy pays no attention to

the superficial distinctions that we humans spend so much time on. We tolerate such distractions at our peril. In the United States alone, in 6 short years this terrible disease has ended thousands of lives prematurely and ruined many times that number. It has already affected our laws, personal behavior, medical practice, schools, politics, theater, advertising policies, drug licensure, and the stock market. Combatting this deadly infection will require all the courage, intelligence, and compassion we can muster.

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